

CREATIVITY AND STANDARDIZATION: COMPLEMENTARY OR CONFLICTING DRIVERS OF TEAM EFFECTIVENESS?

LUCY L. GILSON
JOHN E. MATHIEU
University of Connecticut

CHRISTINA E. SHALLEY
Georgia Institute of Technology

THOMAS M. RUDDY
Siemens Corporation

We examine relationships between creativity, the use of standardized work practices, and effectiveness (measured as both performance and customer satisfaction) among 90 empowered teams of service technicians. Despite the seemingly contradictory natures of creativity and standardized procedures, our results indicate that they can be complementary. Specifically, standardization was found to moderate the relationship between creativity and both team performance and customer satisfaction, although the pattern of results differed for the two measures of effectiveness. We discuss how and when teams can effectively employ both work practices.

With heightened levels of competition and an uncertain economic environment, many organizations are adopting team-based structures to better compete and survive (Sundstrom, 1999). In addition, organizations are encouraging their teams to be creative; creativity has been described as the cornerstone of organizational change, the foundation of innovation, and a key to organizational effectiveness (Amabile, 1996; Woodman, Sawyer, & Griffin, 1993). Concurrently, organizations are streamlining how work is performed and encouraging their employees to standardize work practices and to adhere to consistent sets of procedures that have been found to be successful (Feldman & Pentland, 2003). Consequently, teams are faced with an interesting dilemma as to whether following standardized work practices or being creative will enhance their overall effectiveness.

In traditional team designs, management decides what work practices are most applicable for assignments, and teams carry them out accordingly. However, in more empowered configurations, teams are responsible for deciding how work is to be conducted and how best to achieve overall effectiveness (Hyatt & Ruddy, 1997; Kirkman & Rosen, 1999). Because these types of teams face choices

about how to carry out their work, they provided an appropriate setting for an examination of the relationship between two on the surface contrasting work approaches. The first approach is team encouragement and support of members' *creativity*. The second approach is team encouragement and support of members' adherence to *standardized work practices*. Using a sample of 90 empowered service technician teams from a strategic business unit of a large multinational corporation, we examined whether these two work approaches functioned in a complementary or conflicting manner, as related to team performance and customer satisfaction.

THEORY AND HYPOTHESES

Creativity and Team Effectiveness

Given the dynamic and fluid environment in which many organizations operate, it has been argued that there is a premium on having teams that are willing to try different things, explore new work processes, and otherwise look to improve the manner in which work gets accomplished (Gilson & Shalley, 2004). Creativity has been described as a means to ensure that organizations remain flexible and are able to successfully handle their changing competition, markets, and technological requirements. At the team level, the use of creative processes has long been proffered as an important

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driver of team effectiveness (Hackman & Morris, 1975; Stein, 1975), as well as having been theorized to significantly increase performance (Amabile, 1996; Woodman et al., 1993), yet such associations have not been empirically examined.

The focus of this study is on conditions that foster the use of creative work processes. A creative work process is engagement in behaviors and activities that are directed at developing novel solutions that might work for various tasks (Drazin, Glynn, & Kazanjian, 1999). Creativity can be viewed as a means of identifying problems, using guesswork, developing hypotheses, communicating ideas to others, and contradicting what would normally be expected (Torrance, 1988). Forging a work environment that encourages creativity is a necessary, but not sufficient, condition for the occurrence of creative outcomes (Drazin et al., 1999). A *creative team environment* is one in which members encourage each other to engage in creative activities and to employ creative work processes.

When employees work in teams, they are exposed to a broad range of perspectives, skills, and information that they can use to generate ideas and form new and different options about how work should be done (Tesluk, Farr, & Klein, 1997). It also has been argued that creative potential can be increased through interactions with others and the cross-fertilization of ideas (Perry-Smith & Shalley, 2003). Furthermore, the willingness to engage in creative work processes, especially in interdependent teams, was found to be critically important in a case study of project engineers working on a telecommunications project (Kazanjian, Drazin, & Glynn, 2000). Creative team environments should facilitate members engaging in creative processes that are likely to generate radical breakthroughs, as well as more incremental refinements or adaptations in how work is performed. For example, a service team may try different ways of logging parts, routing calls, or carrying out their tasks. Encouraging members to try new things should result in teams engaging in more creative processes. Therefore, creative team environments that encourage and support the seeking out of novel and different approaches to work should have higher performance.

Teams that explore alternative ways to accomplish their work also should be better able to meet the needs of their customers. Research on customer satisfaction has consistently shown that the attitudes and behaviors of an organization's employees influence customers' perceptions of it (e.g., Schneider & Bowen, 1985). In other words, employees' attitudes and motivation translate into behaviors that result in positive customer experiences. Al-

though most creativity research has focused on creative outcomes, much of this work has been premised on the idea that there is a positive association between creativity and motivation (e.g., Amabile, 1996). Moreover, previous research has found that encouraging creativity decreases job dissatisfaction and stress (e.g., Stokols, Clitheroe, & Zmundzinas, 2002). In addition, being able to be creative at work has been found to be a positive contributor to job satisfaction, health, and welfare (Runco, 1995). On the basis of the above, we expect creative team environments that promote new ways to meet customer needs to enhance customer satisfaction.

Hypothesis 1a. Creative team environments are positively related to team performance.

Hypothesis 1b. Creative team environments are positively related to customer satisfaction.

Standardization and Team Effectiveness

Standardized work practices detail how work should be performed; their goal is to reduce the variance associated with each task and, thereby, improve overall effectiveness (March, 1991). A vital component of standardization is the use of statistical tools to monitor and analyze work processes, so that problems can be highlighted, mistakes can be learned from, and consistent work quality achieved (Crosby, 1989). Therefore, following standardized work procedures derived from data-driven analyses should enhance team performance (Dean & Bowen, 1994).

Many team-based organizations have implemented standardized work practices to provide employees with systems, mechanisms, and guidelines for how work is to be performed (Vogus & Welbourne, 2003). For service technicians such as those studied here, for example, standardized work practices would include adherence to an established set of procedures for accomplishing work during each customer encounter. Thus, teams are encouraged to engage in standardized work practices to minimize ambiguity, manage complexity, avoid costly mistakes, and ensure that accurate work strategies are followed. Work standardization should also help to ensure that high-quality service is delivered to customers (Olian & Rynes, 1991). Much of the seminal work on quality argues that standardization would positively influence customer expectations (e.g., Crosby, 1989). Standardized work practices should result in customers perceiving that employees are knowledgeable and possess a clear set of tools to appropriately meet their needs. Taken together, the components of

standardization, such as consistency and error reduction, should relate positively to performance and customer satisfaction.

Hypothesis 2a. Standardized work practices are positively related to team performance.

Hypothesis 2b. Standardized work practices are positively related to customer satisfaction.

Combined Effects of Creativity and Standardization

Although both creativity and standardization have been linked to team effectiveness, their underlying mechanisms appear to be antithetical. In the management literature, the importance of creativity can be traced back to Burns and Stalker (1961), who argued for change as a means to deal with uncertainty. In contrast, standardization is derived from scientific management (Taylor, 1911), a perspective that suggests routinization is the key to coping with complexity. Creativity stresses taking risks and trying new and different strategies, whereas standardization embraces the development of work patterns that are consistently applied and adhered to. Thus, the core of the creativity paradigm is *enhancing variation* to optimize the fit between team efforts and outcomes, whereas the core of standardization is *minimizing variance* to ensure consistent operations. This antithesis presents teams and ultimately, organizations, with an interesting dilemma. On the one hand, it is desirable for teams to be creative in performing their work; on the other hand, it is desirable for them to adhere to standardized work practices.

Of the many types of teams, empowered service teams such as those examined here should be well positioned to reap the potential benefits of both creativity and standardization. Such teams are usually highly trained on the tasks they perform, as well as on how to handle a complex and diverse customer base (Hyatt & Ruddy, 1997). For instance, during planning sessions, teams decide how to allocate tasks, how work will be sequenced, and so forth. Once at a customer's site, they make decisions on such matters as how to diagnose problems, whether to replace machine parts with new or used parts, or whether to overhaul equipment that might require a lengthier visit. Each of these options involves trade-offs with regards to expenditure, time, and current, as well as possible future, team performance and customer satisfaction. Therefore, teams need to decide whether they should rely on standardized work procedures and/or pursue alternative, and potentially more creative, strategies.

Although standardization and creativity may on

the surface appear to be contradictory, an argument can be made that teams should benefit from both. For instance, a lack of standardized procedures for dealing with certain machine problems may necessitate that teams brainstorm, search for new ways of working, and experiment with unproven approaches. Similarly, although they appear to be mutually exclusive, both practicality and creativity must be considered for successful long-term planning (Shank, Niblock, & Sandalls, 1973). Likewise, theorists have argued that routines can result in flexibility and change (Feldman & Pentland, 2003). Therefore, team work environments should foster both adherence to established work standards and the use of creativity as circumstances warrant. In other words, creativity may be most valuable when combined with high levels of standardization. In contrast, high levels of creativity combined with low levels of standardization may result in chaos and not be at all beneficial. Therefore, we propose that work standardization will positively moderate the influence of creative team work environments as related to both performance and customer satisfaction. Specifically, the effects of creative work environments will be most pronounced when occurring in concert with high standardization, and these effects will be muted when occurring in combination with low standardization.

Hypothesis 3a. Work standardization moderates the relationship between creative team environments and team performance: the positive relationship becomes stronger as work standardization increases.

Hypothesis 3b. Work standardization moderates the relationship between creative team environments and customer satisfaction: the positive relationship becomes stronger as work standardization increases.

METHODS

Participants

Participants for this study were customer service technicians from the Canadian division of a multinational organization that sells, services, and maintains large office equipment. Various divisions of this organization have sponsored other published work (e.g., Gilson, Shalley, & Blum, 2001; Hyatt & Ruddy, 1997; Wageman, 1995) because of an ongoing collaborative relationship between this organization and academicians that has served to benefit and inform both groups. This sample, in particular, is a subset of teams included in Gilson, Mathieu, and Ruddy's (2003) second wave of data, but this

previous study did not examine either creativity or standardization, the primary foci of the present study. Otherwise, the sample used is independent of other efforts and data that have appeared in prior publications.

In this division, all technicians worked in empowered teams responsible for maintaining equipment and fulfilling customer needs in a designated geographical area. Team size was based upon a formula that included equipment proliferation, age, and service history in a given area; the average team size was six members (range = 3–8). We did not collect demographic information from respondents to help maintain confidentiality. However, company records indicated that approximately 90 percent of the service technicians were male, and their company tenure ranged from 4 to 28 years (\bar{x} = 14.3, *s.d.* = 6.67). Survey data were received from a total of 492 members of 156 teams, yielding a total response rate of 55 percent. However, because we conducted our analysis at the team level, only teams for which we received information from three or more respondents were included in our analysis (for teams, n = 90; for individuals, n = 379). This subset did not differ significantly from the others on any substantive variable.

The primary job of these technicians was the service and repair of office document production systems at customer locations. In terms of Wageman's (1995) teamwork classification, the majority of their daily tasks could be described as independent because technicians, for the most part, go out alone on service calls. Nevertheless, the success of individual technicians was attributable, in part, to how well routes are laid out, what equipment they had on hand, what knowledge repositories about the customers they served and the machines they maintained were available, and so forth. In other

words, the efforts of individuals were really the by-products of the contributions and coordination of many others from their team. Also, it was not unusual for team members to contact one another while preparing for a call or at a customer location. In addition, for both training purposes, and when faced with a difficult client or complex problem, they frequently worked in pairs. Furthermore, group functioning and performance were highly interdependent, as members were responsible for deciding how work should be divided, resources allocated, budgets spent, work strategies developed, performance monitored, and new members recruited and trained. In addition, approximately 20 percent of their total compensation was based on how well they performed as a collective.

Measures

Team members completed surveys during work hours that contained items designed for general organizational assessment purposes. However, for this study we used only items and scales that were designed specifically to measure a team's creative work environment and use of standard work procedures. All items focused specifically on team-level activities and used team referents. Responses were coded on Likert-type scales, with 1 for "strongly disagree" and 5 for "strongly agree." Table 1 presents the reliability coefficients and descriptive statistics for all scales. Additionally, we justified aggregation of responses by testing interrater agreement (r_{wg} ; James, Demaree, & Wolf, 1984) and used intraclass correlation coefficients (ICCs) to test whether between-group variance was sufficient to warrant team-level modeling (Bliese, 2000).

Creative team environment. We assessed the creativity of the teams' environments using three

TABLE 1
Correlations and Descriptive Statistics^a

Variables	Mean	s.d.	1	2	3	4
1. Creative processes	3.68	0.33	(.79)			
2. Standard processes	3.69	0.33	.46***	(.89)		
3. Customer satisfaction	60.43	10.76	.21*	.34**	(.87)	
4. Quantitative performance	0.09	2.71	.42***	.28**	.20	(.89)
Median r_{wg}			.92	.94	n.a.	n.a.
ICC(1)			.31	.49	n.a.	n.a.
ICC(2)			.66	.80	n.a.	n.a.

^a n = 90 teams. Values in parentheses are reliability coefficients.

* p < .05

** p < .01

*** p < .001

items written for this study, informed by the literature, and grounded in our participants' organizational setting. Because there is no established scale and "generally no accepted operationalization of the creativity concept" (Leenders, van Engelen, & Kratzer, 2003: 76), we developed a three-item measure based, in part, on the work of Kazanjian and colleagues (2000). The items asked whether team members, as a whole: (1) welcomed change, (2) encouraged each other to try new things, even though they might not work, and (3) were willing to try creative solutions to solve difficult problems. Because team members evidenced high agreement on their ratings of these items (median $r_{wg} = .92$), we averaged their responses. Teams also exhibited sufficient between-group variance for testing our hypotheses: the value for ICC(1), representing the ratio of between-group to total variance, was .31; the value for ICC(2), representing the reliability of average group perceptions, was .66; and the overall measure had an aggregate reliability coefficient alpha of .79.

Standardized work practices. All the teams were trained in a number of procedures aimed at standardizing how work was conducted. We measured work standardization using five items written for this study and based both on the extant literature and the procedures used by this organization. Questions asked whether a team employed methods such as standard problem-solving procedures on a regular basis, had documented work processes, and followed documented work sequences. Team members evidenced high agreement on these items (median $r_{wg} = .95$), so we averaged their responses. Teams also exhibited sufficient between-group variance for hypothesis testing (ICC[1] = .49; ICC[2] = .80). The overall measure had an aggregate reliability coefficient alpha of .89.

Team performance. We used three archival measures gathered by the organization to track team effectiveness and determine team rewards. Prior research has used similar indexes, and they have been described as sensitive to differences between team variables (e.g., Hyatt & Ruddy, 1997; Wageman, 1995). All measures were cumulated for the three months following the survey data collection. The organization also provided us with average month-to-month stability coefficients for each measure (reported below) that we used to calculate an overall reliability index. Because these indexes were proprietary, they are converted to Z-scores here.¹

Machine reliability was the average number of copies made by machines between service calls

(three-month $r_{yy} = .84$). Higher values on this measure represented better performance. All the teams had targets, based on equipment type and age, for how many copies their machines should make before a service call was placed. *Response time* was the average length of time between a customer's call and the technician's (or technicians') arrival (three-month $r_{yy} = .87$). *Parts expense* was the percentage of budget associated with replacing machine parts (three-month $r_{yy} = .48$). This internal measure did not influence customer billing as customers were on annual service contracts. Teams had monthly parts budgets, based on the type and age of the equipment in their territories, that they decided how to allocate. Because lower response time and parts expense represented better performance, we multiplied their Z-scores by -1 so that higher values would correspond to better performance. The three performance indexes collectively constituted an *aggregate construct*. That is, their combination defined an overall performance criterion, yet they were not presumed to be parallel indicators of some universe. Therefore, we used the three-month stability coefficients noted above and the variances of the three indexes and their composite to calculate the reliability of their equally weighted aggregate: $r_{yy} = 1 - [3 - (.84 + .87 + .48)] / 7.36 = .89$ (see Nunnally & Bernstein, 1994: 266–270).

Customer satisfaction. Every month, the company sent surveys directly to a random sample of customers who had had service technicians visit during the month. Surveys were returned directly to corporate headquarters and were anonymous, except for zip codes, which were used for matching. On average, 76 surveys (range = 6–170) were returned per team over the three months studied here. Customer satisfaction was an organizationally determined measure that assessed entire service encounters (Gilson et al., 2001; Hyatt & Ruddy, 1997). For example, customers were asked to rate the helpfulness of the technician(s), their satisfaction with the visit(s), and their overall satisfaction with their service team. (1, "very dissatisfied," to 5, "very satisfied"); the company then converted these ratings into 20–100 percent indexes. Composite indexes, per team per month, of this measure were made available to us for this study ($\bar{x} = 60.43$, s.d. = 10.76). We calculated the stability coefficient (r_{yy}) for the three-month set of these ratings as .87.

RESULTS

Prior to testing our hypotheses, we performed a confirmatory factor analysis (CFA) to ensure the discriminant validity of our creativity and standard work practices measures (Venkatraman & Grant,

¹ The r_{yy} statistics shown here are reliabilities of the measures that were converted to Z-scores.

1986). Using the covariance matrix, we estimated a two-factor CFA that yielded quite good fit indexes ($\chi^2[19] = 37.71$, $p < .01$; CFI = .96; SRMSR = .06). All items exhibited significant (t 's > 7.00 , $p < .05$) relationships with their intended latent variables. In contrast, we estimated a single-factor CFA model (with all items mapping to a single latent variable) that exhibited a significantly ($\Delta\chi^2[1] = 72.60$, $p < .001$) poorer fit ($\chi^2[20] = 110.31$, $p < .001$; CFI = .81; SRMSR = .11). These results indicated that the creativity and standardization items exhibited sufficient discriminant validity for use in our hypotheses testing. Notably, both measures correlated positively and significantly with customer satisfaction and objective performance ($p < .05$), as well as with each other ($r = .46$, $p < .001$). The two effectiveness outcome variables, however, were not significantly correlated ($r = .20$, n.s.).

To facilitate the interpretation of the moderated regression effects, we mean-centered both independent variables. We then conducted a three-stage multiple regression analysis for each dependent variable. In the first stage, we regressed performance (or customer satisfaction) on both creativity and standardization. We then added quadratic terms for both creativity and standardization in a second step to control for the potentially confounding effects of curvilinearity (cf. Cortina, 1993). Finally, we added a product term computed between creativity and standardization to test our interaction hypotheses.

For the equation using performance as the dependent variable, significant variance was explained ($R^2 = .18$, $p < .01$) by the "main effects." Inspection of the beta weights revealed that the relationship

for creativity was significant ($\beta = .37$, $p < .01$), but work standardization was not ($\beta = .11$, n.s.). Thus, support was found for Hypothesis 1a, but not for Hypothesis 2a. For the equation using customer satisfaction as the dependent variable, significant variance was explained ($R^2 = .12$, $p < .01$) by the main effects, and the beta weights revealed that the relationship for standardized work practices was significant ($\beta = .31$, $p < .01$), but creativity was not ($\beta = .07$, n.s.). Thus, support was found for Hypothesis 2b but not for Hypothesis 1b.

Adding the two quadratic terms to the performance equation produced no significant change ($\Delta R^2 = .03$, n.s.). Similarly, adding the two quadratic terms to the customer satisfaction equation failed to produce a significant change in the amount of explained variance ($\Delta R^2 = .04$, n.s.). Therefore, the curvilinearity of either creativity or standardization does not present a potential confound for our interactive effects. Finally, Hypothesis 3a and Hypothesis 3b were tested in the third step of the regression analyses. The addition of the product term yielded values that supported these hypotheses ($\Delta R^2 = .34$, $p < .01$, performance; $\Delta R^2 = .24$, $p < .05$, customer satisfaction). Figures 1 and 2 illustrate the interactions. For performance, contrary to our hypotheses, we found that creativity exhibited no significant effect when standardized work practices were high yet displayed a positive and significant ($p < .05$) relationship when standardization was low. In other words, high work standardization appeared to stifle the influence of creative team environments, whereas low standardization appeared to facilitate the impact of creativity on performance. In contrast, creativity was not

FIGURE 1

Team Performance: Interaction between Creativity and Standardization

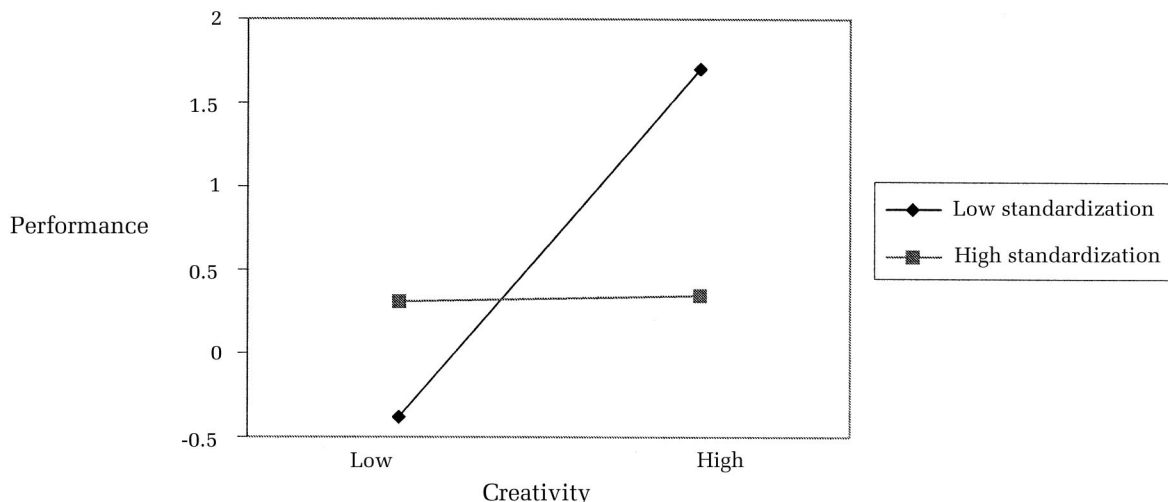
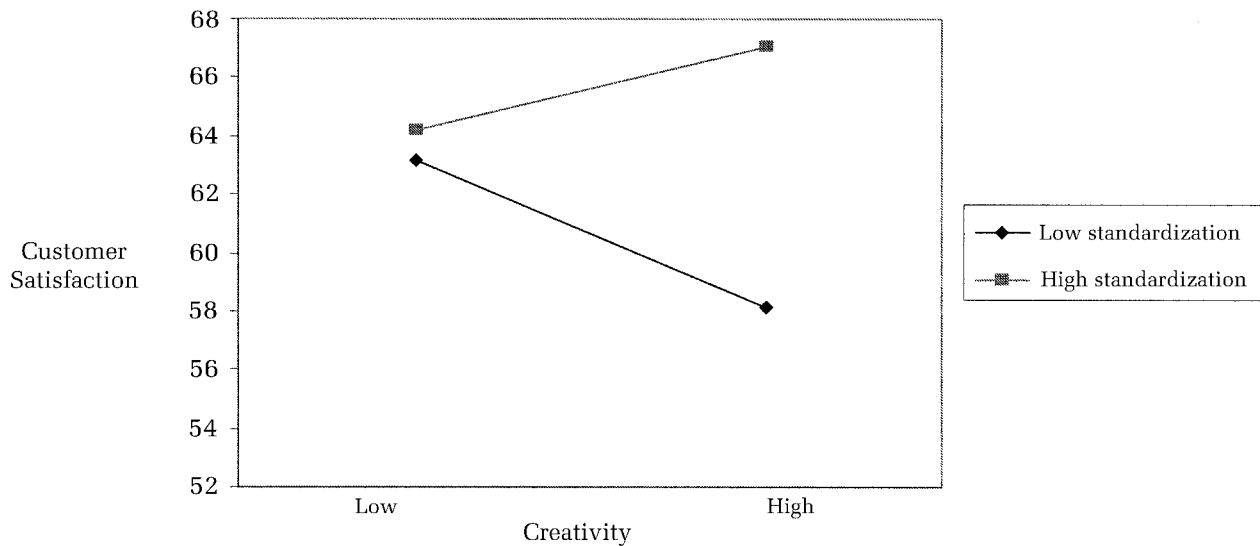


FIGURE 2

Customer Satisfaction: Interaction between Creativity and Standardization

related to customer satisfaction ($p < .10$) when standardization was high and had a significant ($p < .05$), negative slope when standardization was low. This form was consistent with our hypothesis, as we anticipated that the influence of creativity on customer satisfaction would be most positive when creativity occurred in combination with high work standardization. Alternatively, the relationship between creativity and customer satisfaction was at its lowest when work standardization decreased.

DISCUSSION

In this research, we offer the first empirical test of the relationships among creativity, standardization, and team effectiveness. Our results point to a number of interesting, novel, and potentially important findings that advance theory and inform practice. We examined both customer satisfaction and performance as outcomes because they are critically important, but very different, effectiveness criteria that exist for this and many other organizations. Nevertheless, we expected that creativity and standardization would have similar effects on both variables. Focusing strictly on the main effects for a moment, one sees an interesting picture emerge. For customer satisfaction, we found a significant, positive association for standardization, but none for creativity. Therefore, it appears that teams that adhere to established practices and follow documented procedures have higher levels of customer satisfaction. However, teams with more creative environments have significantly higher levels of performance, with work standardization not being

a significant predictor. Our results suggest that customers may prefer standardization as it removes ambiguity from their service interactions. However, with a highly skilled and well-trained workforce, like the service technician teams in this research, a creative team environment rather than work standardization appears to benefit performance. Consequently, teams and, ultimately, organizations face an interesting dilemma in that they need to strike a balance between being creative and employing standardized work practices.

While an examination of the main effects may tell an interesting story, the interactive effects we obtained far overshadow them. Our figures depict two significant, yet very different, patterns of moderated results. The performance interaction suggests that standardization attenuates the influence of a team's creative work environment, with creativity exhibiting greater and positive relationships with performance as the use of standardized work practices diminishes. The nature of this moderation suggests that teams that are overly constrained by work standards and routines may be unable to reap the benefits of creativity. However, teams that operate in a less standardized fashion and encourage and support creativity exhibited the highest performance. The plot for the customer satisfaction interaction again shows that standardization moderates the influence of a creative team environment. Here, the results suggest that creativity exhibited in the context of high work standardization is not related to customer reactions; more telling is the fact that creativity occurring in the context of low

standardization is associated with significantly lower customer satisfaction.

Theoretical and Practical Implications

Prior research has shown that customers are almost solely interested in the efficiency and competence of their service providers, and in whether they can solve problems quickly and at a low cost (Sutton & Rafaeli, 1988). From a customer's perspective, this focus can be equated with following standardized work procedures rather than with being creative. For example, Hyatt and Ruddy (1997) found positive correlations between the extent to which teams had consistent norms and roles and customer satisfaction. Apparently, when faced with a malfunctioning machine, customers prefer to see a technician who is working in a systematic fashion.

When teams seem to be trying new or multiple approaches, they may appear less competent to customers. However, as our results indicate, creative and standard practices are not mutually exclusive and can complement each other to benefit both performance and customer satisfaction. For instance, although creativity and standardized work practices are distinguishable (as the CFA confirmed), we obtained a positive correlation between the two variables ($r = .46, p < .01$). Therefore, the two work approaches can occur in concert, and managers may want to consider their synthesis. For example, Sutton (2002) suggested that creative people should be sheltered from customers because they may be hesitant to try new things in front of those who evaluate them; thus, collecting customer satisfaction data may keep employees from trying new things. Unfortunately, sheltering service technician teams from customers is simply untenable. Therefore, managers and organizations need to consider alternative approaches that encourage teams to use both creative and standardized work procedures.

One option is training. Traditionally, technician teams are trained in equipment repair and maintenance routines. However, managers may want to consider ways of training employees to be more creative, given that when creative processes are combined with lower standardization, they are associated with higher performance. Alternatively, training teams to be creative during planning sessions or when conducting their behind-the-scenes work, away from customers, may also be beneficial. Therefore, teams may want to be more creative in determining how they should respond to customer calls and deciding who should be sent, and when, to different customer sites. These types of decisions

and procedures can perhaps benefit from a creative team environment more than the work that is performed at customer sites.

Alternatively, teams may need to reconsider the entire service encounter and focus on it as a whole instead of focusing on a number of component parts. For instance, Bowen and Schneider (1988) asserted that the quality of the interaction between employees and customers is critical in determining customer satisfaction. It could be that if team members are being creative, they may be less focused on interpersonal exchanges with customers, which may lead to lower customer satisfaction. This scenario may be particularly likely to occur if customers witness what they perceive as unusual work practices. According to prior creativity research, the creative process takes a great deal more time and cognitive effort than working in a more standardized manner (e.g., Ford, 1996). If teams are being creative, they may be taking more time to complete a task and may be less attentive to customers than they would be otherwise. In addition, researchers have found that some customers base attitudes toward service interactions on the interpersonal skills of their service providers (Bowen & Schneider, 1988). This association may account for why customer satisfaction and performance were not significantly correlated in this study. Thus, training service technicians on how to manage customers' perceptions and relations throughout service encounters may be critical. For example, it might be that having them explain to customers that it will take longer to repair a machine than was initially thought because they are making it more reliable for the future may well pay dividends in terms of both higher performance *and* customer satisfaction.

Perhaps the most fruitful answer for both practice and research resides at a finer level of analysis. Teams may need to be skilled in using both approaches—creativity and standardization—and should learn to adapt their work styles as circumstances warrant. For example, the literature on “high-reliability organizations” suggests that adherence to standardized work procedures and routines optimizes effectiveness under normal operating conditions (Roberts, 1990; Vogus & Welbourne, 2003). However, when faced with an extreme or unanticipated circumstance, such organizations or teams are most effective when they can innovate and improvise. Therefore, this approach suggests that there may well be some circumstances in which standardization is the preferable method of operation, whereas in other instances more creative approaches are required. Optimally, effective teams will be ones that are “mindful” and can recognize

the type of situation they are facing and therefore, will be able to transform their modes of operation as necessary.

Lastly, it may be that teams need to employ standardized practices as a way to buy them time in front of customers as they try to think of new and different work procedures that may be more appropriate. As Kahn (1990) suggested, teams may or may not need to engage and disengage in certain activities and behaviors, as a situation warrants. Therefore, broad-brush characterizations of teams as being either standardized or creative might well miss their ability to read situations and to react accordingly. Tests of whether teams can read and react to situations with the needed flexibility would require a focus on performance episodes and tracking teams across situations that impose different performance demands (cf. Marks, Mathieu, & Zaccaro, 2001).

Limitations and Future Research

Recently, theorists have called for the examination of creativity in jobs where employees have not traditionally been expected to be creative or rewarded directly for being creative (Shalley, Gilson, & Blum, 2000; Unsworth, 2001). In this study, we were able to sample such a population and find that team creative work environments exhibited significant, positive main and interactive relationships with team performance. Because we had team members supply the creativity and work standardization indexes, it is possible that some social desirability bias in responding existed. Naturally, it is preferable to have multiple sources of such evaluations. Adding these would have been difficult with our sample, however, because service technicians work at the boundaries of organizations. Consequently, management is not well positioned to make such judgments and customers are not much better suited, as their frames of reference are limited. Therefore, although ratings might be biased, alternative measures of such activities might not be better. This limitation remains an important issue for future research. We believe that major strengths of this study are that the relationships were tested with data from multiple sources (i.e., team evaluations, objective performance, and external customer satisfaction), and our criteria measures were lagged; however, our study design remains correlational and as such it is subject to the influence of other factors not included here.

Clear boundaries for generalizations from this work pertain to the setting, nature, and make-up of our teams. Specifically, we studied empowered service teams comprised of mostly white males. Be-

cause they work in an empowered setting, they had a great deal of latitude as to how to complete their work (Hyatt & Ruddy, 1997; Kirkman & Rosen, 1999). The empowered design provides a ripe setting for testing the ideas of interest here as it represents a "weak situation": such teams are not constrained to operate in any particular manner. Consequently, although we believe that the relationships we examined would generalize beyond such teams, our results may not apply as well where teams have less decision latitude. Notably, we studied action teams conducting service activities. The extent to which our findings pertain to other types of teams performing other types of work is another question for future research. Moreover, a question remains as to whether the same pattern of results would be obtained from a more diverse sample. Our hope is that this investigation, and the interesting results obtained, will encourage others to pursue which of these, or other, explanations underlie the relationships among creativity, standardized work practices, and team effectiveness.

Finally, a potential limitation of our study is our measure of creativity. We employed measures of the extent to which a team environment encouraged or fostered creativity. To date, research has only started to examine team creative processes (e.g., Gilson & Shalley, 2004; Kazanjian et al., 2000), and consequently, established measures at the team level do not exist. However, in developing our own measure we were heavily influenced by the organizational reality in which these service technicians worked, and therefore, the generalization of our measure and its external validity needs to be carefully considered. Future research should employ direct indexes of the creative processes that teams execute. Also, research will probably benefit from case studies and qualitative techniques, such as observation of teams at customer sites and in team meetings. Another strategy would be to utilize some type of "experience sampling method" (Kubey, Larson, & Csikszentmihalyi, 1996), in which team members are signaled at random times and asked to report what they are doing. At issue is that it would be informative to differentiate creative processes that are executed during transition or preparation periods from those that are exhibited during action phases with customers on the job site (see Marks et al., 2001). Distinguishing when, and under what conditions, creativity and standardized work practices are used, and examining their unique and combined influences on team effectiveness, will prove extremely valuable for research and practice alike.

In conclusion, our results highlight the importance of creative team environments for team effec-

tiveness. The quality movement (e.g., Dean & Bowen, 1994) stresses the importance of process improvement and continual learning. Our results indicate that teams should be encouraged to be creative in tandem with using standardized work practices in order to maximize both performance and customer satisfaction.

REFERENCES

- Amabile, T. M. 1996. *Creativity in context*. Boulder, CO: Westview Press.
- Bliese, P. D. 2000. Within-group agreement, non-independence, and reliability: Implications for data aggregation and analyses. In K. J. Klein & S. W. J. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations: Foundations, extensions, and new directions*: 349–381. San Francisco: Jossey-Bass.
- Bowen, D., & Schneider, B. 1988. Service marketing and management: Implications for organizational behavior. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior*, vol. 10: 43–80. Greenwich, CT: JAI Press.
- Burns, T., & Stalker, G. M. 1961. *The management of innovation*. London: Tavistock.
- Cortina, J. M. 1993. Interaction, nonlinearity and multicollinearity: Implications for multiple regression. *Journal of Management*, 19: 915–922.
- Crosby, P. B. 1989. *Let's talk quality*. New York: McGraw-Hill.
- Dean, J. W., & Bowen, D. E. 1994. Management theory and total quality: Improving research and practice through theory development. *Academy of Management Review*, 19: 392–418.
- Drazin, R., Glynn, M., & Kazanjian, R. 1999. Multilevel theorizing about creativity in organizations. *Academy of Management Review*, 24: 286–307.
- Feldman, M. S., & Pentland, B. T. 2003. Reconceptualizing organizational routines as a source of flexibility and change. *Administrative Science Quarterly*, 48: 94–118.
- Ford, C. M. 1996. A theory of individual creative action in multiple social domains. *Academy of Management Review*, 21: 1112–1143.
- Gilson, L. L., Mathieu, J. E., & Ruddy, T. M. 2003. *Empowerment and team effectiveness: Empirical tests of a work redesign intervention and an integrated model of team effectiveness*. Paper presented at the annual meeting of the Academy of Management, Seattle.
- Gilson, L. L., & Shalley, C. E. 2004. A little creativity goes a long way: An examination of teams' engagement in creative processes. *Journal of Management*, 30: 453–470.
- Gilson, L. L., Shalley, C. E., & Blum, T. C. 2001. Team and organizational attitudes as a lens and mirror impacting customer satisfaction: An empirical test in self-managed teams. *Journal of Quality Management*, 6: 235–256.
- Hackman, J. R., & Morris, C. G. 1975. Group tasks, group interaction processes, and group performance effectiveness: A review & proposed integration. In L. L. Berkowitz (Ed.), *Advances in experimental social psychology*: 45–99. New York: Academic Press.
- Hyatt, D. E., & Ruddy, T. M. 1997. An examination of the relationship between work group characteristics and performance: Once more into the breach. *Personnel Psychology*, 50: 553–585.
- James, L. R., Demaree, R. G., & Wolf, G. 1984. Estimating within group interrater reliability with and without response bias. *Journal of Applied Psychology*, 69: 85–98.
- Kahn, W. A. 1990. Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33: 692–724.
- Kazanjian, R. K., Drazin, R., & Glynn, M. A. 2000. Creativity and technological learning: The roles of organization architecture and crisis in large-scale projects. *Journal of Engineering and Technology Management*, 17: 273–298.
- Kirkman, B. L., & Rosen, B. 1999. Beyond self-management: Antecedents and consequences of team empowerment. *Academy of Management Journal*, 42: 58–74.
- Kubey, R., Larson, R., & Csikszentmihalyi, M. 1996. Experience sampling method applications to communication research questions. *Journal of Communication*, 46(2): 99–120.
- Leenders, R., van Engelen, J., & Kratzer, J. 2003. Virtuality, communication, and new product team creativity: A social network perspective. *Journal of Engineering and Technology Management*, 20: 69–92.
- March, J. G. 1991. Exploration and exploitations in organizational learning. *Organization Science*, 21: 71–87.
- Marks, M. A., Mathieu, J. E., & Zaccaro, S. J. 2001. A temporally based framework & taxonomy of team processes. *Academy of Management Review*, 26: 356–376.
- Nunnally, J. C., & Bernstein, I. H. 1994. *Psychometric theory*. New York: McGraw-Hill.
- Olian, J. D., & Rynes, S. L. 1991. Making total quality work: Aligning organizational processes, performance measures, and stakeholders. *Human Resource Management*, 30: 303–333.
- Perry-Smith, J. E., & Shalley, C. E. 2003. The social side of creativity: A static and dynamic social network perspective. *Academy of Management Review*, 28: 89–106.
- Roberts, K. H. 1990. Some characteristics of high reliability

- ity organizations. *Organization Science*, 1(2): 160–177.
- Runco, M. A. 1995. The creativity and job satisfaction of artists in organizations. *Empirical Studies of Art*, 13(1): 39–45.
- Schneider, B., & Bowen, D. E. 1985. Employee and customer perceptions of service banks: Replication and extension. *Journal of Applied Psychology*, 70: 423–433.
- Shalley, C. E., Gilson, L. L., & Blum, T. C. 2000. Matching creativity requirements and the work environment: Effects on satisfaction and intentions to leave. *Academy of Management Journal*, 43: 215–224.
- Shank, J. K., Niblock, E. G., & Sandalls, W. T. 1973. Balance “creativity” and “practicality” in formal planning. *Harvard Business Review*, 51(1): 97–94.
- Stein, M. I. 1975. *Stimulating creativity*. New York: Academic Press.
- Stokols, D., Clitheroe, C., & Zmundzinas, M. 2002. Qualities of the work environment that promote perceived support for creativity. *Creativity Research Journal*, 14: 137–147.
- Sundstrom, E. 1999. *Supporting work team effectiveness*. San Francisco: Jossey-Bass.
- Sutton, B. I. 2002. The weird rules of creativity. *Harvard Business Review*, 80(September): 94–103.
- Sutton, B. I., & Rafaeli, A. 1988. Untangling the relationship between displayed emotions and organizational sales: The case of convenience stores. *Academy of Management Journal*, 31: 461–487.
- Taylor, F. W. 1911. *The principles of scientific management*. New York: Harper & Brothers.
- Tesluk, P. E., Farr, J. L., & Klein, S. R. 1997. Influences of organizational culture and climate on individual creativity. *Journal of Creative Behavior*, 31: 27–41.
- Torrance, E. P. 1988. The nature of creativity as manifest in its testing. In R. J. Sternberg (Ed.), *The nature of creativity: Contemporary psychological views*: 43–75. Cambridge, England: University Press.
- Unsworth, K. 2001. Unpacking creativity. *Academy of Management Review*, 26: 289–297.
- Venkatraman, N., & Grant, J. 1986. Construct measurement in organizational strategy research: A critique and proposal. *Academy of Management Review*, 11: 71–87.
- Vogus, T., & Welbourne, T. 2003. Structuring for high reliability: HR practices and mindful processes in reliability-seeking organizations. *Journal of Organizational Behavior*, 24: 877–903.
- Wageman, R. 1995. Interdependence and group effectiveness. *Administrative Science Quarterly*, 40: 145–180.
- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. 1993. Toward a theory of organizational creativity. *Academy of Management Review*, 18: 293–332.



Lucy L. Gilson (*lucy.gilson@business.uconn.edu*) is an assistant professor of management at the University of Connecticut. She received her Ph.D. in organizational behavior from the Georgia Institute of Technology. Her research predominantly focuses on work teams, virtual communication, creativity, diversity, justice, and empowerment.

John E. Mathieu (*john.mathieu@business.uconn.edu*) is a Northeast Utilities Scholar Professor of Management at the University of Connecticut. He received a Ph.D. in industrial and organizational psychology from Old Dominion University. His current research interests include models of training effectiveness, team and multiteam processes, and cross-level models of organizational behavior. In particular, his recent work has focused on how team composition (e.g., member abilities, experience, personalities, etc.) influences team performance trajectories over time, how team training and other interventions (e.g., technological aids) enhance team effectiveness, and how teams of teams coordinate their joint efforts.

Christina E. Shalley (*christina.shalley@mgt.gatech.edu*) is a professor of organizational behavior and human resource management in the College of Management at the Georgia Institute of Technology. She received her Ph.D. in business administration from the University of Illinois at Urbana-Champaign. Her current research interests focus on investigating the effects of various social and contextual factors in enhancing or stifling employee creativity and examining ways to structure jobs and the work environment to support creative work.

Thomas M. Ruddy (*thomas.ruddy@siemens.com*) is the senior director of human resources and organizational development for Siemens Corporation. Tom has conducted extensive research in the areas of knowledge management, team effectiveness, total quality management, organizational structure, performance evaluation, employee retention, customer satisfaction, leadership development, and employee selection and assessment. Tom received his doctorate in industrial and organizational psychology from Bowling Green State University.



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